

Maine Ventless Trap Lobster Monitoring Survey

Introduction

The Maine American lobster (*Homarus americanus*) fishery is the state's most valuable commercial fishery. Landings in 2006 were 66.6 million pounds with a peak ex-vessel value of \$272.6 million. Reported landings have declined slightly (5%) from the peak of 70 million pounds in 2004 (the first year of mandatory landings reporting). However, estimates suggest landings may have declined as much as 25% since 2002 (Wilson *et al.* 2004). With the dramatic decline in the lobster resource south of Cape Cod and subsequent impacts on the fishery, it is imperative to effectively monitor the relative distribution and abundance of the lobster fishery in coastal waters.

To address this need, a cooperative random stratified ventless trap survey was designed to generate accurate estimates of the spatial distribution of lobster length frequency, lobster relative abundance and recruitment while attempting to eliminate the biases identified in conventional fishery dependent surveys. In the past, fishery-dependent trap sampling data have not been included in generating relative abundance indices for the American lobster due to associated bias with the data collection method. Lobstermen are very efficient at catching lobsters and will only fish where lobsters tend to congregate and move their gear to follow their annual migrations, thus not giving an accurate picture of the resource relative to the entire area. A fishery-independent survey, wherein scientists and contracted fishermen cooperatively collect the data, will provide greater control over the sampling design, data quality and quantity necessary to maintain a stratified sampling approach that provides unbiased data.

Maine's Department of Marine Resources (DMR) commenced this cooperative random stratified ventless trap survey in June 2006 based on a regional sampling design developed cooperatively by New England coastal states from Maine to New York. This survey differs from previous ventless projects as traps are placed at randomly chosen locations and depths.

Objectives

To address the need to develop a robust time series of relative abundance and recruitment, a cooperative random stratified ventless trap survey has been designed to generate accurate estimates of lobster relative abundance and future recruitment while attempting to eliminate the biases identified in conventional surveys.

Project Objectives:

- 1) Characterize relative abundance and size-distribution of American lobster from three statistical areas along the coast of Maine.
- 2) Develop a pilot project for a coastwide fishery independent monitoring program for American lobster.
- 3) Document the relative importance of depth and location as it pertains to American lobster abundance and distribution.
- 4) Foster an improved relationship between the commercial lobster industry and fisheries scientists and managers in the interest of strengthening communication between science and industry.
- 5) Foster industry “buy-in” to the lobster stock assessment process.
- 6) Provide the DMR with the ability to effectively participate in the management of the lobster fishery in accordance with the Atlantic Coastal Fisheries Cooperative Management Act and enable the state to implement the lobster Fishery Management Plans enacted by the Atlantic State Marine Fisheries Commission (ASMFC).

Survey Design

A random-stratified sampling design was applied to near shore National Marine Fisheries Service (NMFS) statistical areas from Maine to New York. Each statistical area was assigned three depth strata (1 to 20 m, 21 to 40 m and 41 to 60 m).

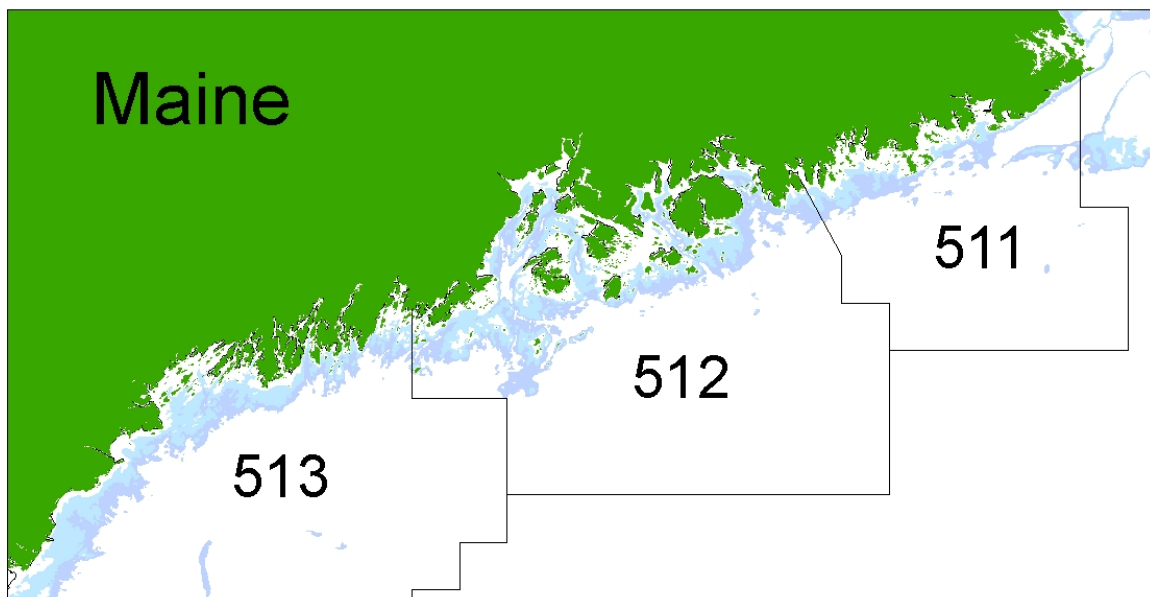


Figure 1. The NMFS statistical areas along the Maine coast. Bathymetry is represented as three strata; 0-20 m (white inshore), 21-40 m (light) and 41-60 m (dark) respectively.

A standardized 1-nautical mile grid, with unique identifiers, was generated for the entire New England coast, where each grid was assigned a depth stratum. The grids were scored under the 75% rule, where 75% of the depths in that one mile grid were of a prescribed depth stratum. The 1-mile grids that did

not conform to this description were labeled as mixed and assigned a depth strata based on the central location. Locations outside of state territorial waters (>3 miles) were excluded due to sampling constraints.

Each station will be sampled by six (6) traps set in two (2) triples or one (1) six trap trawl, in which vented and ventless traps were alternated (3 of each per station). The central position (latitude/longitude) of each grid will serve as an initial starting location from which industry participants will select the final location (no further than 0.5 nm from central position) within the appropriate depth strata. For the 2007 survey, the number of sites has been increased from 72 to 123 in order to increase the proportion of sites along the coast that will be sampled (Table 1).

Table 1. Summary of the number of sites by statistical area in the 2006 survey and 2007 survey.

Statistical Area	Total Sites	2006 sites	2006 traps	Proportion of sites sampled 06'	2007-08 sites	2007-08 traps	Proportion of sites to be sampled 07-08'
511	556	24	144	4.3%	24	144	4.3%
512	1715	24	144	1.4%	60	360	3.5%
513	1128	24	144	2.1%	39	204	3.5%

Trap Design and Construction

Traps are standardize to 40" L x 21" W x 16" H single parlor lobster trap with 5" entrance hoops, 1" square rubber coated 12-gauge wire, standard shrimp mesh netting, cement runners, 4" x 6" disabling door, and one legal rectangular vent. All traps were constructed by Brooks Trap Mill in Thomaston, Maine (Figure 2).

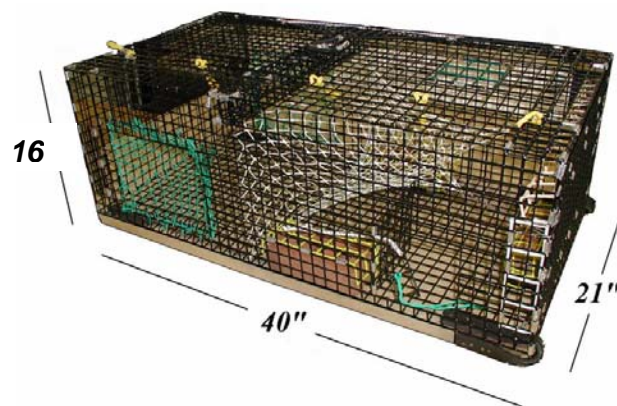


Figure 2. Standardized Ventless Trap used for the Ventless Trap Survey. Traps were assembled as triples or 6-trap trawls depending on local fishing practices.

Survey Duration

All traps will be hauled and sampled twice per month during the months of

June, July and August, with a 3 day soak time between hauls. Traps will then be disabled by opening a side door for the remainder of the month, or will be brought back to the dock until the following month.

Catch/Effort and Biological Data

Biological data will be collected by trained sea samplers and participating fishermen on commercial fishing vessels. Data collected included lobster size, sex, shell condition, presence or absence of eggs, cull status, V-notch status, mortality, incidence and severity of shell disease, crab by-catch numbers and species, gear type (vented or ventless traps), total traps hauled for trip, catch per trap haul, soak time, and trap locations (latitude/longitude).